New Frontiers
Announcement of Opportunity
Phase A Kick-off Meeting

NASA Launch Services

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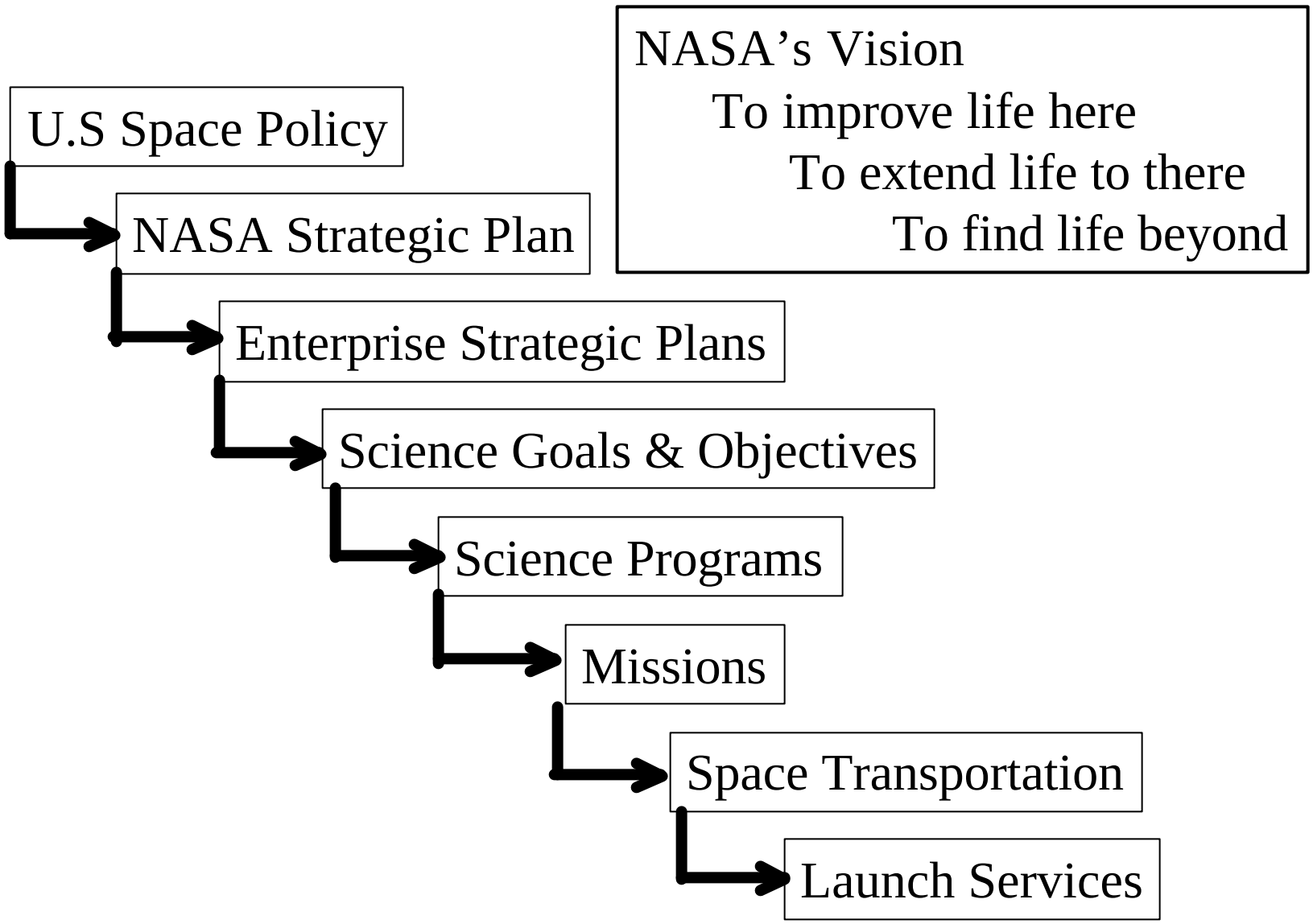
National Space Policy to NASA's Launch Services



Launch Services Organization

- **The Office of Space Operations, Launch Services is Responsible for:**
  - Identify and Aggregate Agency Launch Requirements
  - Assure Access to Space on All Available Launch Systems
    - Shuttle
    - DOD
    - Commercial Launch Vehicles
    - Foreign Vehicles
  - Office of Space Operations is the front door to Agency/DOD/other civil Gov't payload customers
  - Lead HQ strategy for meeting launch requirements/managing priorities/conflicts
  - Chair Flight Planning Board and maintain Agency launch manifest
  - Program Direction for Launch Service Program
  - Identify/acquire new launch services
  - Agency technical lead for space transportation policy discussions
  - Provide Single Interface for Mission Directorate Payload Customer at Headquarters

NASA ELV Policies

- NASA utilization of expendable launch services is governed/driven by the following Agency-level NASA Policy Directives (NPD):
  - NPD 8610.7, Launch Services Risk Mitigation Policy for NASA-Owned Or NASA-Sponsored Payloads
  - NPD 8610.23A, Technical Oversight of Expendable Launch Vehicle (ELV) Launch Services
  - NPD 8610.24A, Expendable Launch Vehicle (ELV) Launch Services Pre-launch Readiness Reviews

NASA Launch Mitigation Policy

- **NPD 8610.7 – Launch Services Risk Mitigation Policy for NASA-owned or NASA-sponsored payloads**

- **Establishes the policy and criteria to assess mission risk based on vehicle maturity, demonstrated flight history, and NASA's technical review of vehicle design**

- **NASA Payloads are reviewed by the Flight Planning Board and categorized based on the sponsoring Enterprise's deemed value of the mission:**

  - Cat 1: Missions deemed non-mission critical to the sponsoring Enterprise's strategic objectives – can be considered for flight on Launch vehicles with no flight history

  - Cat 2: Missions deemed mission critical to the sponsoring Enterprise's strategic objectives and of moderate cost/complexity – can be considered for flight on NASA-acquired launch service on a vehicle with at least one demonstrated flight

  - Cat 3: Mission deemed mission critical with complex interface and higher cost – must be flown on vehicles with acceptable demonstrated flight history

NASA Manifesting Process

- **NASA's launch manifest requirements are established, prioritized and managed through the NASA Flight Planning Board**
  - **Chaired by Office of Space Operations, Launch Services Asst. Assoc. Administrator**
  - **Representatives from all NASA Mission Directorates**
  - **Manifest includes all NASA-sponsored space launches**

- **The Mission Directorate sponsoring for missions (AOs) are responsible for submitting launch requirement to the Flight Planning Board**

- **Launch Requirements are reviewed by the Flight Planning Board for:**
  - **Risk**
  - **Launch Date**
  - **Launch Vehicle (availability, launch history)**
  - **Launch Service Contract (existing or new)**

- **NASA Launch Services Program (hosted at KSC) is chartered to implement acquisition and management of requisite launch services for NASA-sponsored missions, from the private sector or other government agencies , as appropriate**

NASA Launch Services – Key Points

- **National Policy directs NASA to utilize commercially available domestic launch services, to the maximum extent possible**
  - **Exception to acquire foreign services, require White House coordination and approval**
- **Mission Specific Launch Services are procured and managed by NASA and provided as a full service to Spacecraft team – integrated process in-place**
- **Two ELV performance classes offered for this AO - Intermediate & Heavy**
- **Assignment to a specific launch vehicle is executed through an established procurement process after the launch requirements have been solidified and the Mission Directorate has committed Phase C/D funding to this mission and risk assessment reviewed and concurred in by the Flight Planning Board**
  - **AO Proposal Teams are required to maintain compatibility with both ELV families within the respective performance class**
- **Costs for vehicle classes are provided in the New Frontiers AO Library**
  - **No changes anticipated from pre-Phase A phase**

Alternate Launch Services

- **Foreign Launch Services**
  - **Contributed foreign launch services require interagency coordination and concurrence (no funds exchanged)**
  - **Non Nuclear Payloads Only**
  - **Address export control & technology transfer issues**
  - **Launch vehicle availability**
  - **Consistent with NASA NPD 8610.7**
    - **Flight history**
    - **Technical risk mitigation**
    - **Costs - Technical insight & risk mitigation**
    - **Evaluated on case-by case basis**
- **Dual manifest or secondary payloads on domestic LV's will not be considered under this AO**
- **Space shuttle launch is not an option available under this AO**

NASA Launch Services - Content

- **NASA Launch Services include:**
  - **Launch Vehicle – hardware, software, production, logistics, operations**
  - **Standard Services – engineering, pre-/post-flight analysis, mission integration, etc.**
  - **Non-Standard services – pre-priced options**
  - **Payload Processing Facility – Government-owned or Commercial**
  - **Minor mission unique modifications – custom requirements**
    - **Major modifications must be reviewed for feasibility and will likely be additional cost over-and-above the cost provided in the AO guidelines**
  - **Launch service technical management**
  - **All NASA technical oversight in accordance with NASA Policies**
  - **Launch Vehicle Telemetry**
  - **Safety and mission assurance**
  - **Independent launch service assessment**
  - **Launch campaign and day-of-launch management**

- **Nuclear Missions require and include:**
  - **Launch Vehicle Databooks**
  - **Launch site accommodations (e.g., logistics, security, etc.) for nuclear materials**
  - **Material handling/logistics by DOE**
  - **Range Safety requirements**

Launch Service Support and Evaluation for this AO

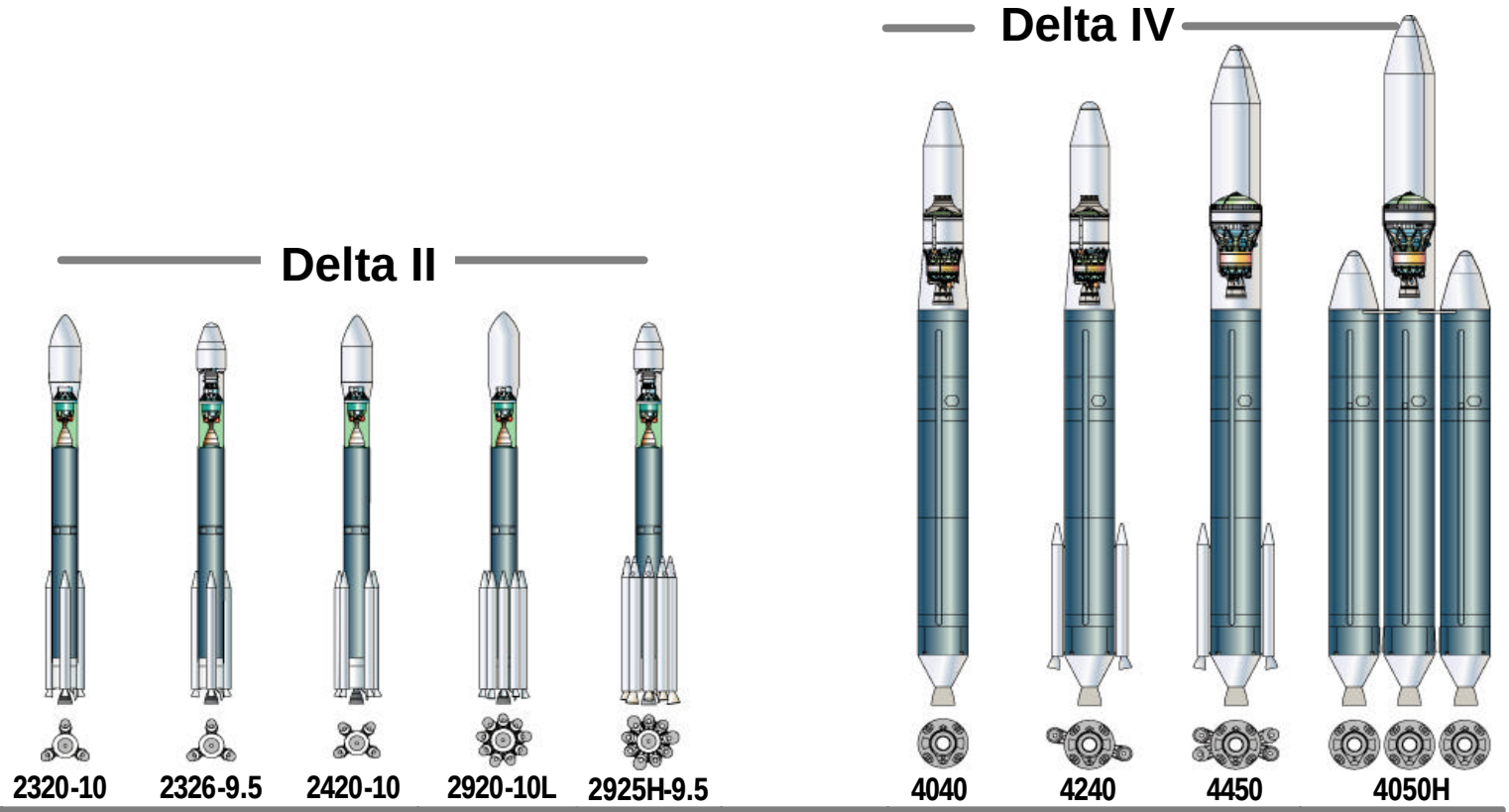
- **The NASA Launch Services Program will serve as the coordinator for all AO Proposers**
  - **Assist in providing launch vehicle data and information as required by AO Teams**
  - **Assess feasibility of mission-unique requirements**
  - **Note: Input based on communication outside of the NASA LSP (eg with an individual launch provider) will not be considered/evaluated**

- **The information/discussions with LSP representative will be "firewalled" from the evaluation process**

- **A separate LSP representative(s) will be assigned to the evaluation process for launch services support which includes:**
  - **Overall assessment**
  - **Performance (Margin)**
  - **LV to SC Interface**
    - **PLF**
    - **Mechanical Interface**
    - **Environments**
    - **Mission Unique Modifications**
  - **Cost**

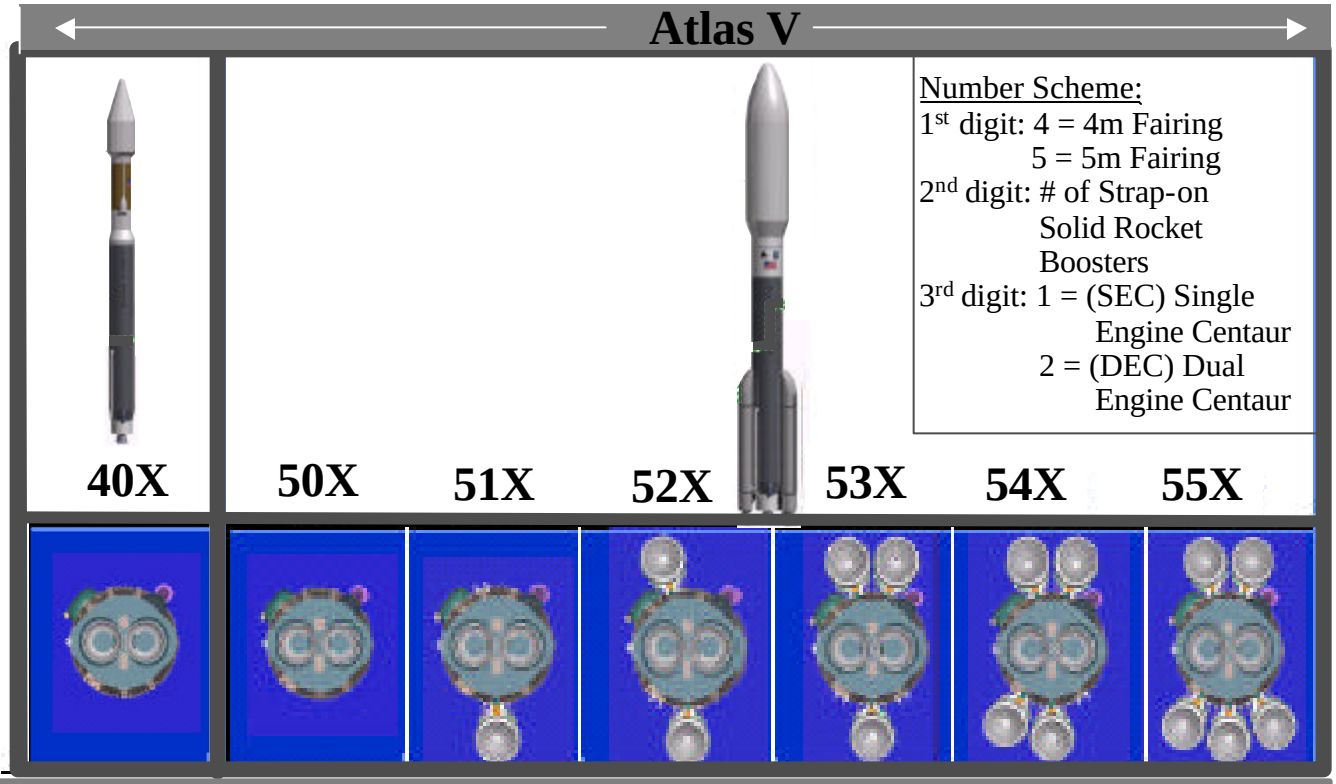
NASA Launch Services – The Boeing Company

LAUNCH SERVICES



Launch Service		Delta II Medium/Medium Lite			Delta II	Delta II		Delta IV			Delta IV H
Generic LV Performance[2] (kg)											
LEO (500km, 28.5deg)		2,460	N/A	2,855	4,450	N/A		8,690	11,575	13,100	23,165
SSO (500km)		1,755	N/A	2,120	3,305	N/A		6,915	9,410	10,930	21,040
GTO (35,788km, 28.5deg)		N/A	925	N/A	N/A	2,170		3,985	5,630	6,345	12,650
High Energy	$C_3 = 0\ km^2/s^2$	N/A	600	N/A	N/A	1,525		2,735	4,075	4,580	9,305
	$C_3 = 10\ km^2/s^2$	N/A	490	N/A	N/A	1,235		2,115	3,275	3,685	7,810

NASA Launch Services - LMCLS



Launch Service		Atlas V	Atlas V					
Generic LV Performance[2] (kg):								
LEO (500km, 28.5deg)		9,445/11,500	9,540 (DEC)	9,880/11,490	12,180/13,735	14,045/15,840	15,715/17,450	17,145/18,910
SSO (500km)		N/A	N/A	N/A	N/A	N/A	N/A	N/A
GTO (35,788km, 28.5deg)		4,765 (SEC)	3,880 (SEC)	5,175 (SEC)	6,180 (SEC)	7,105 (SEC)	7,880 (SEC)	8,570 (SEC)
High Energy	C_3 = 0 km^2/s^2	3,445 (SEC)	2,680 (SEC)	3,765 (SEC)	4,545 (SEC)	5,210 (SEC)	5,820 (SEC)	6,330 (SEC)
	C_3 = 10 km^2/s^2	2,840 (SEC)	2,150 (SEC)	3,100 (SEC)	3,765 (SEC)	4,345 (SEC)	4,865 (SEC)	5,300 (SEC)

NASA LAUNCH SERVICES MANIFEST

APPROVED
FLIGHT PLANNING
BOARD 9/15/03

	CY '03	CY '04	CY '05	CY '06	CY '07	CY '08	CY '09	CY '10
•SECONDARY (S) •DELTA (D/S) •TAURUS (T/S)		TBD △ SPACETECH 5 NET 12/04 D/S □ ProSEDS -NET 5/04						
•SMALL CLASS (SC) •PEGASUS (P) •TAURUS (SH)	○ P SORCE - 1/25 △ P GALEX - 4/28 P SCISAT - 8/12	P DART - 10/18		P AIM - 9/06 T GLORY* - 12/06*	SC SPACETECH 8 - 6/07 T Orbiting Carbon Observatory - 8/07 P SMEX-10 - 8/07	T GEOSPACE ITM-8/08 SC △ SMEX-11 - 8/08		T GEOSPACE RBM-8/10 T GPMC - 4Q/10 SC SMEX-12 - 8/10
•MEDIUM CLASS (MC) •DELTA 7325/7320 (D3) •DELTA 7425/7426 (D4) •DELTA 7920/7925 (D) •DELTA 7920 H (DH) •TITAN II (T-II) - VAFB	D3 ICESAT/CHIPS 1/12 △ D MER A - 6/10 △ DH MER B - 7/7 △ DH SIRTF - 8/25 D GPB - NET 12/6	D AURA - NET 2/6 △ D4 SWIFT - NET 4/29 △ DH MESSENGER - 5/11 D3 NOAA N - NET 9/15 D △ DEEP IMPACT - 12/30	D4 CLOUDSAT/CALIPSO NET 1/29* D3 NOAA-N' - 10/05 D △ STEREO - 11/15	△ DH DAWN - 5/06 D △ THEMIS (MIDEX-5) 8/06 DH NPP-BRIDGE - 10/06 D3 OCEAN SURFACE TOPOGRAPHY - 12/06	△ DH GLAST - 2/07 D3 STSS - 7/07 D △ OSS OPP - 8/07 △ DH PHOENIX - 8/9 (MARS SCOUT) D △ KEPLER - 10/07 D4(T*) WISE (MIDEX-6) 12/07	D3 AQUARIUS - 3/08	△ DH* MMS - 1/09 △ D* DISCOVERY 11 2/09 D* GEC - 9/30 D △ MARS TELECOM* 10/09 D4 * MIDEX-7 - 12/09	D4 * △ MIDEX-8 - 12/10
•INTERMEDIATE (IC) / HEAVY CLASS (HC) •ATLAS (AIII&AV) •DELTA (DIII&IV) •DELTA IV HEAVY (IVH)		DIV ○ GOES-N - 12/1	DIV ○ GOES-O - 12/05 AV △ MARS RECON ORBITER - 8/10	AV-H △ NEW HORIZONS 1/11 IC ◇ X-37*- 7/06	DIV ○ GOES-P - 4/07	IC △ SDO - 4/08 IC △ NEW FRONTIERS 12/08 HC* ◇ OSP DEMO - 4Q/08	IC △ MARS SCIENCE LAB - 10/09* HC △ SIM - 12/09	HC* ◇ OSP* - 4Q/10

* FOR NASA PLANNING PURPOSES
** FAILURE

△ = OSS □ = OSF ⬡ = OBPR ✓ = VAFB LAUNCH
○ = OES ◇ = OAT ⬠ = DOD REIMBURSABLE

K. PONIATOWSKI
C:SALVAS MANI-11-LG FPB 9/15/03